FIG. 1

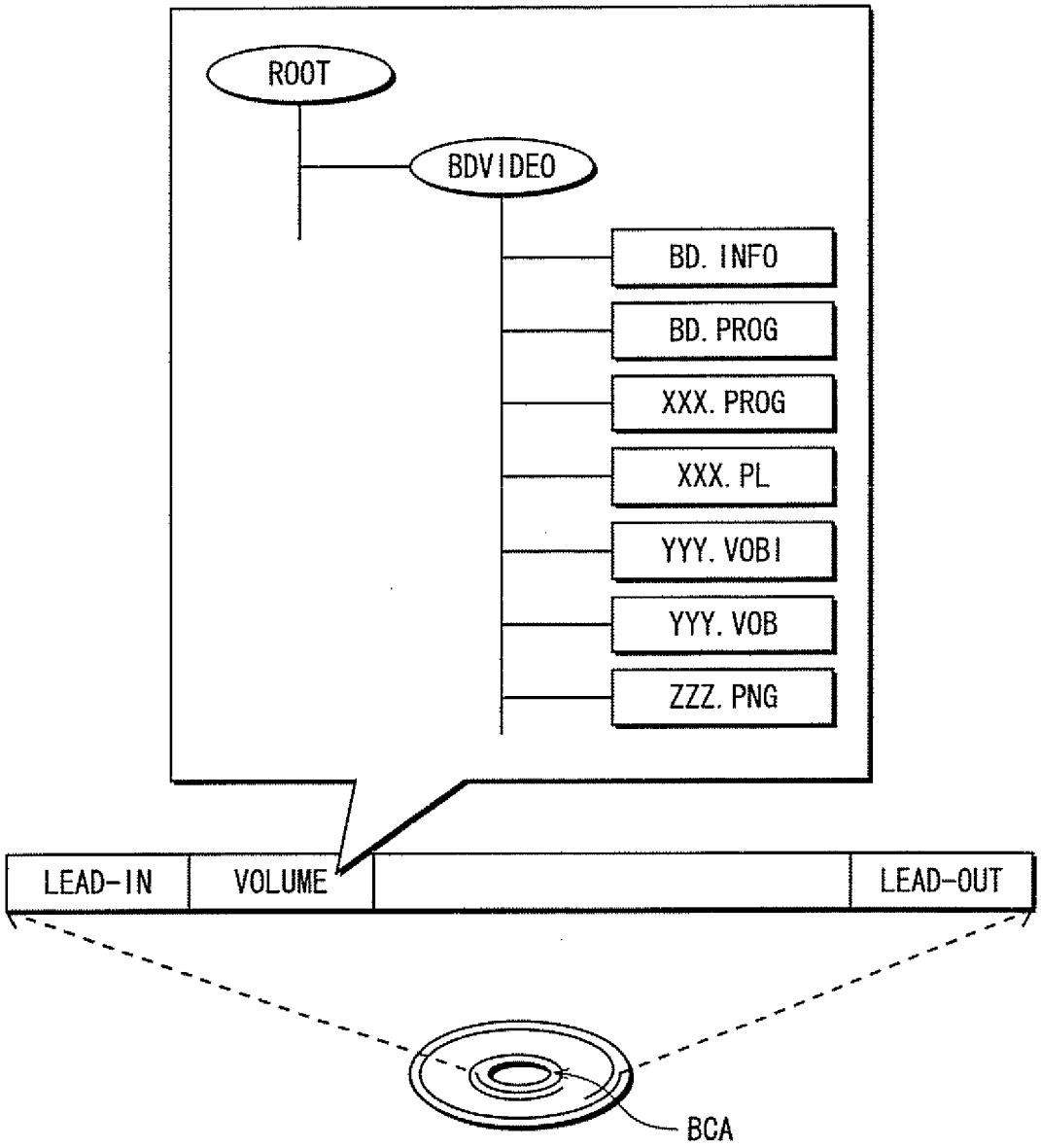

ROOT
BDVIDEO
BD. INFO
BD. PROG
XXX. PROG
XXX. PL
YYY. VOBI
YYY. VOB
ZZZ. PNG
LEAD-IN
VOLUME
LEAD-OUT
BCA

FIG. 2

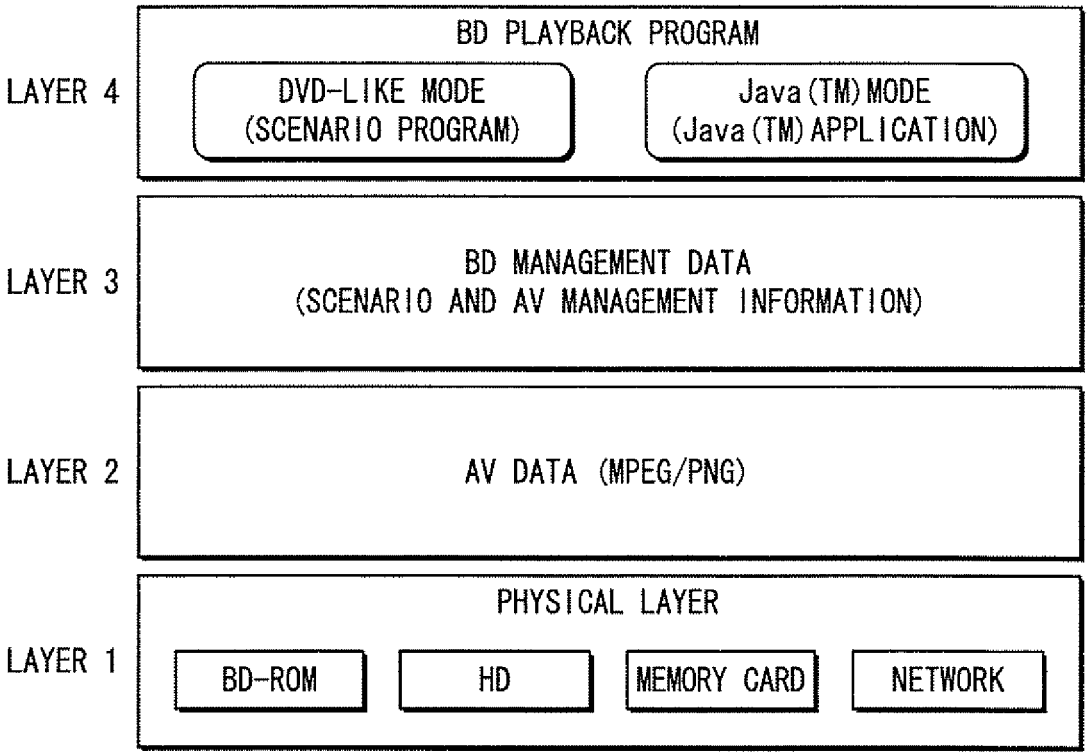

LAYER 4
BD PLAYBACK PROGRAM
DVD-LIKE MODE
(SCENARIO PROGRAM)
Java(TM) MODE
(Java(TM) APPLICATION)
LAYER 3
BD MANAGEMENT DATA
(SCENARIO AND AV MANAGEMENT INFORMATION)
LAYER 2
AV DATA (MPEG/PNG)
LAYER 1
PHYSICAL LAYER
BD-ROM
HD
MEMORY CARD
NETWORK

FIG. 3A

NORMAL PLAYBACK IN DVD-LIKE MODE

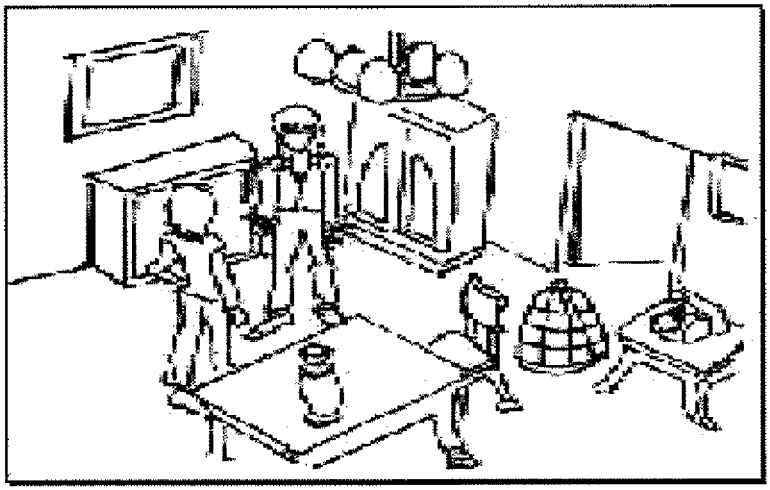


FIG. 3B

ENHANCEMENT OF ADDED VALUE IN Java(TM) MODE

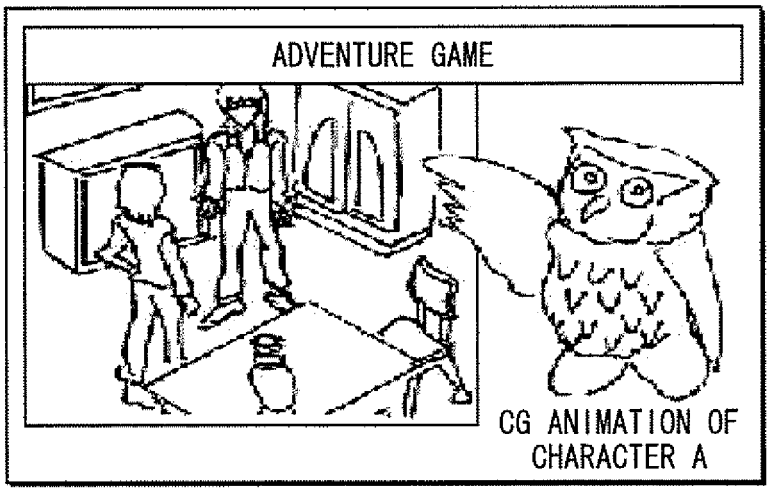


FIG. 4

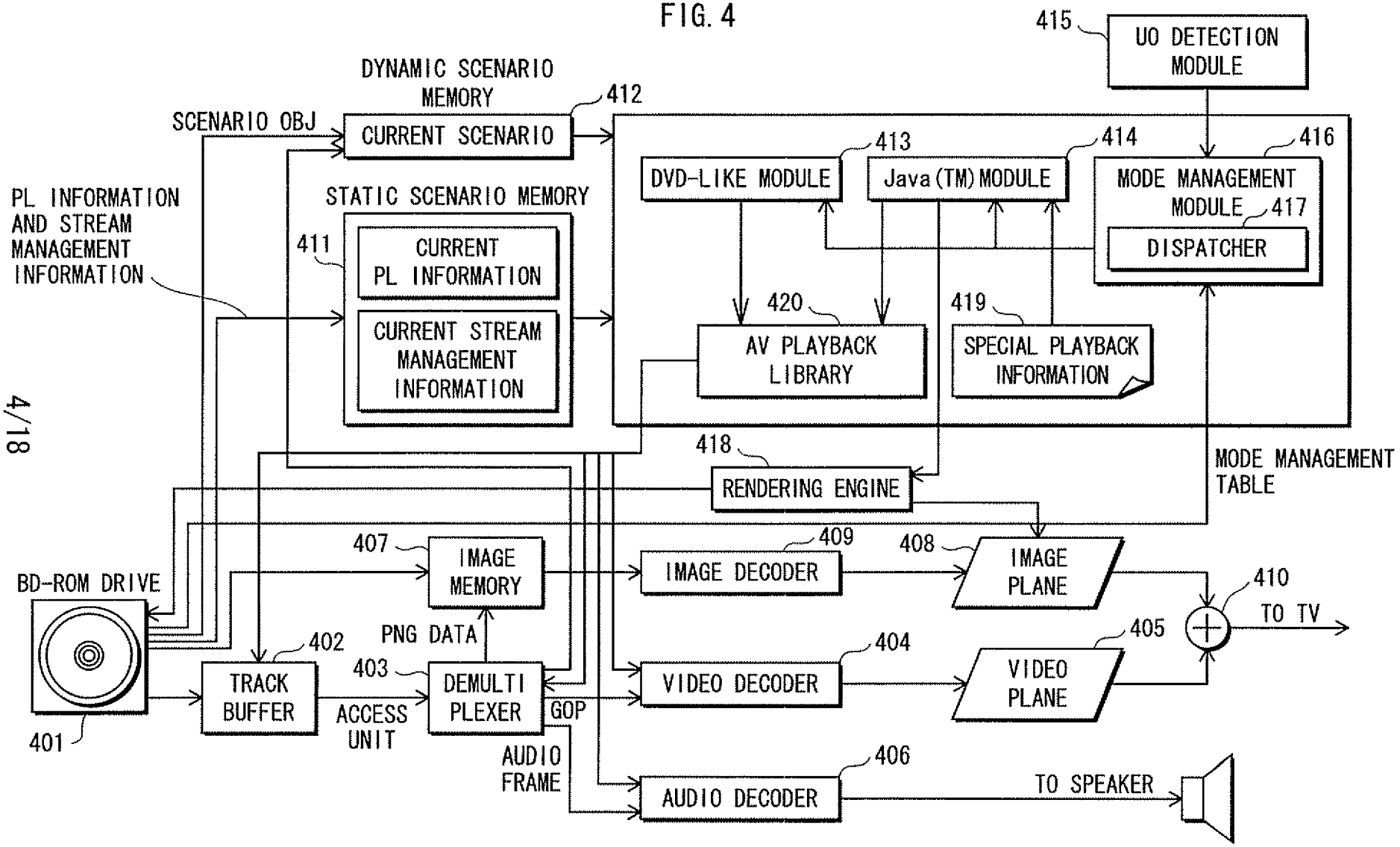

415
UO DETECTION MODULE
DYNAMIC SCENARIO MEMORY
412
SCENARIO OBJ
CURRENT SCENARIO
413
DVD-LIKE MODULE
414
Java(TM) MODULE
416
MODE MANAGEMENT MODULE
417
DISPATCHER
PL INFORMATION AND STREAM MANAGEMENT INFORMATION
STATIC SCENARIO MEMORY
411
CURRENT PL INFORMATION
CURRENT STREAM MANAGEMENT INFORMATION
420
AV PLAYBACK LIBRARY
419
SPECIAL PLAYBACK INFORMATION
418
RENDERING ENGINE
MODE MANAGEMENT TABLE
407
IMAGE MEMORY
409
IMAGE DECODER
408
IMAGE PLANE
410
TO TV
BD-ROM DRIVE
PNG DATA
402
403
404
405
TRACK BUFFER
ACCESS UNIT
DEMULTI PLEXER
GOP
VIDEO DECODER
VIDEO PLANE
401
AUDIO FRAME
406
AUDIO DECODER
TO SPEAKER

FIG. 5

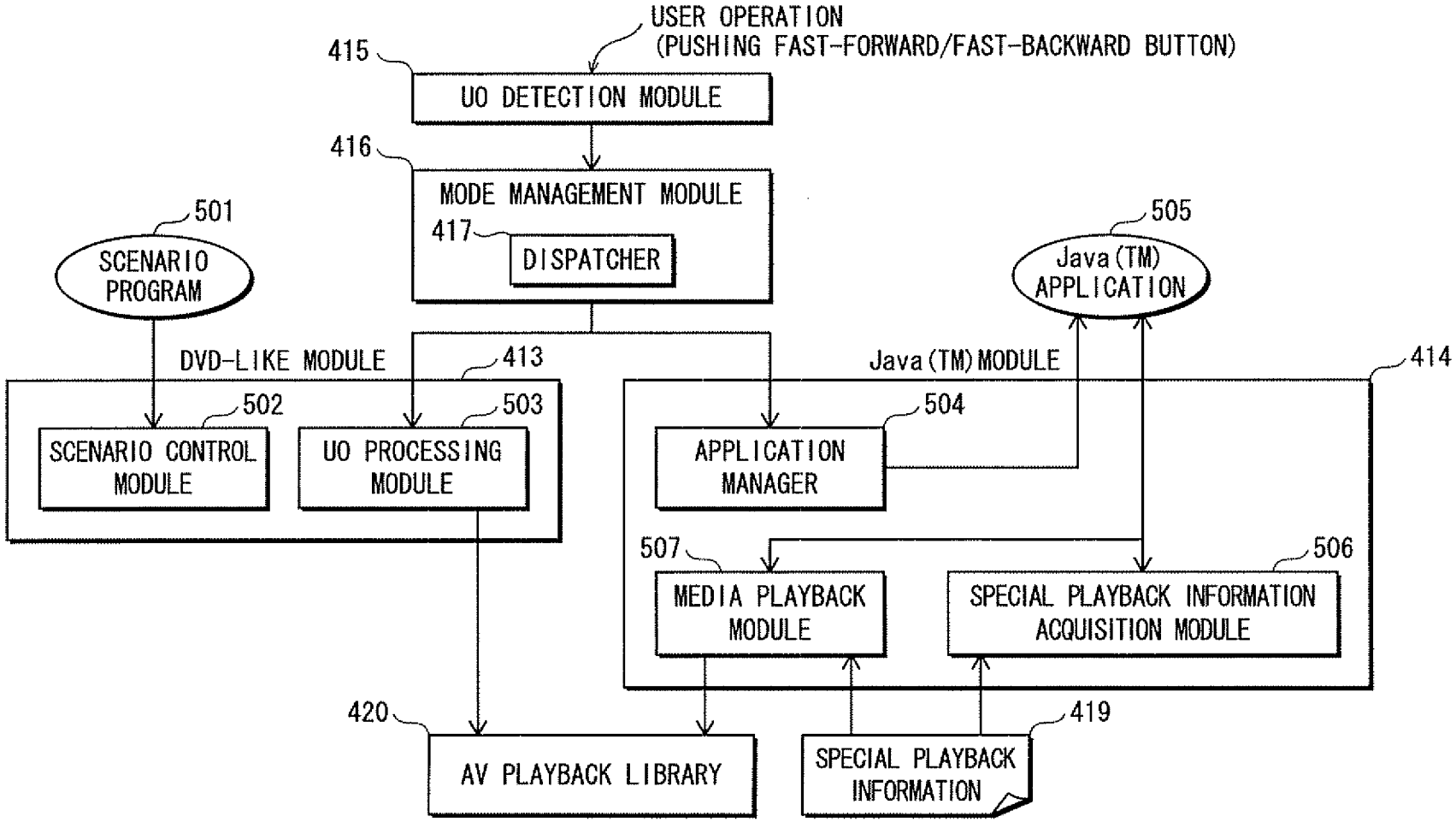

USER OPERATION
(PUSHING FAST-FORWARD/FAST-BACKWARD BUTTON)
415
UO DETECTION MODULE
416
MODE MANAGEMENT MODULE
417
DISPATCHER
501
SCENARIO PROGRAM
505
Java(TM) APPLICATION
DVD-LIKE MODULE
413
Java(TM)MODULE
414
502
SCENARIO CONTROL MODULE
503
UO PROCESSING MODULE
504
APPLICATION MANAGER
507
MEDIA PLAYBACK MODULE
506
SPECIAL PLAYBACK INFORMATION ACQUISITION MODULE
420
AV PLAYBACK LIBRARY
419
SPECIAL PLAYBACK INFORMATION

FIG. 6

SPECIAL PLAYBACK INFORMATION

FAST-FORWARD PLAYBACK

SPECIAL PLAYBACK OPERATION IN DVD-LIKE MODE		TERMINAL SUPPORT RATE
ID OF CORRESPONDING BUTTON	PUSHING COUNT OF BUTTON	
FAST-FORWARD#1	1	2.0
—	—	10.0
FAST-FORWARD#1	2	30.0
—	—	60.0
FAST-FORWARD#1	3	120.0

FAST-BACKWARD PLAYBACK

SPECIAL PLAYBACK OPERATION IN DVD-LIKE MODE		TERMINAL SUPPORT RATE
ID OF CORRESPONDING BUTTON	PUSHING COUNT OF BUTTON	
FAST-BACKWARD#1	1	-2.0
—	—	-10.0
FAST-BACKWARD#1	2	-30.0
—	—	-60.0
FAST-BACKWARD#1	3	-120.0

SLOW-FORWARD PLAYBACK

SPECIAL PLAYBACK OPERATION IN DVD-LIKE MODE		TERMINAL SUPPORT RATE
ID OF CORRESPONDING BUTTON	PUSHING COUNT OF BUTTON	
SLOW#1	1	0.5
—	—	0.1
SLOW#1	2	0.01

SLOW-BACKWARD PLAYBACK

SPECIAL PLAYBACK OPERATION IN DVD-LIKE MODE		TERMINAL SUPPORT RATE
ID OF CORRESPONDING BUTTON	PUSHING COUNT OF BUTTON	
SLOW#2	1	-0.5
—	—	-0.1
SLOW#2	2	-0.01

FIG. 7

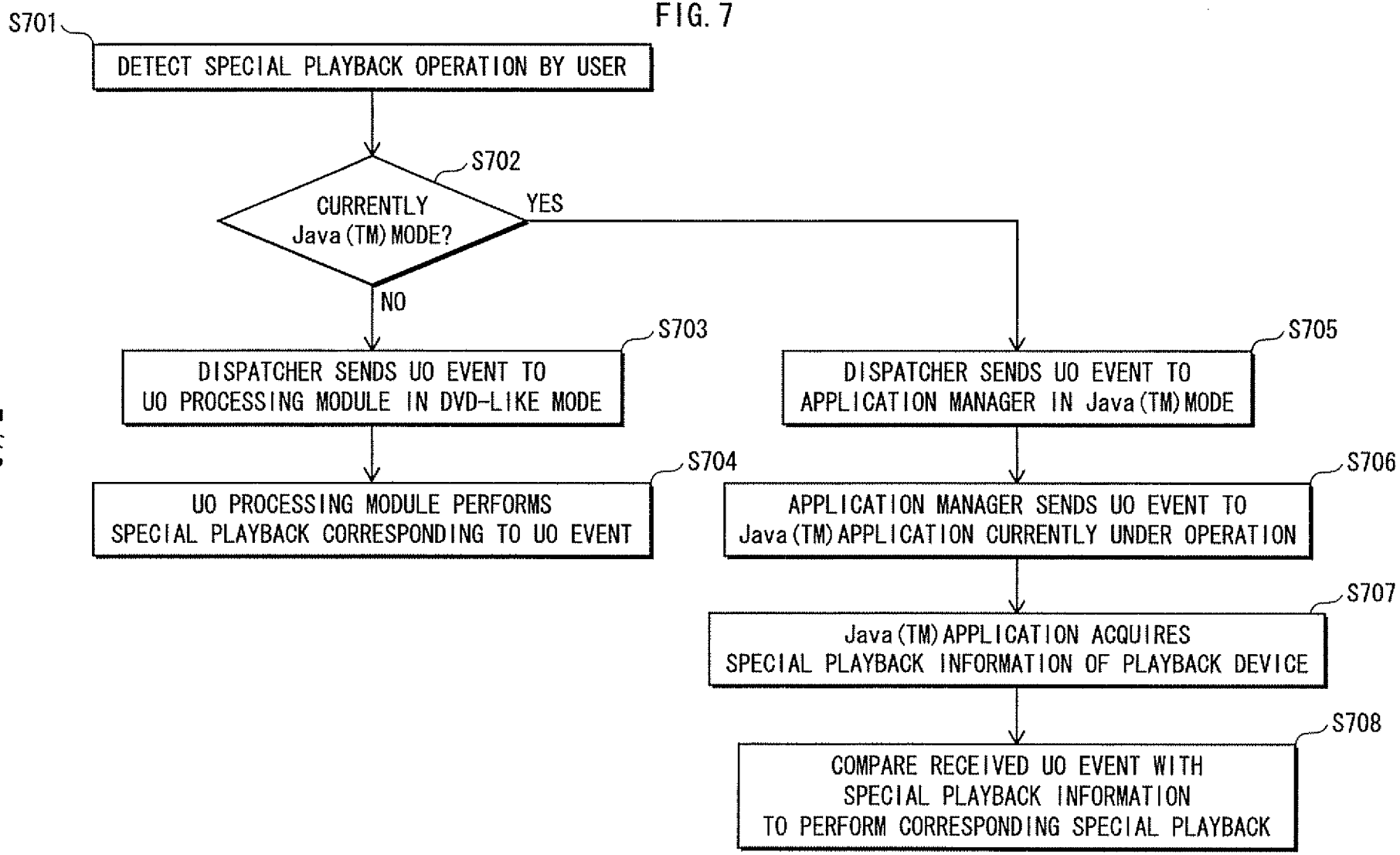

S701
DETECT SPECIAL PLAYBACK OPERATION BY USER
S702
CURRENTLY Java(TM) MODE?
YES
NO
S703
DISPATCHER SENDS UO EVENT TO UO PROCESSING MODULE IN DVD-LIKE MODE
S704
UO PROCESSING MODULE PERFORMS SPECIAL PLAYBACK CORRESPONDING TO UO EVENT
S705
DISPATCHER SENDS UO EVENT TO APPLICATION MANAGER IN Java(TM) MODE
S706
APPLICATION MANAGER SENDS UO EVENT TO Java(TM) APPLICATION CURRENTLY UNDER OPERATION
S707
Java(TM) APPLICATION ACQUIRES SPECIAL PLAYBACK INFORMATION OF PLAYBACK DEVICE
S708
COMPARE RECEIVED UO EVENT WITH SPECIAL PLAYBACK INFORMATION TO PERFORM CORRESPONDING SPECIAL PLAYBACK

FIG. 8

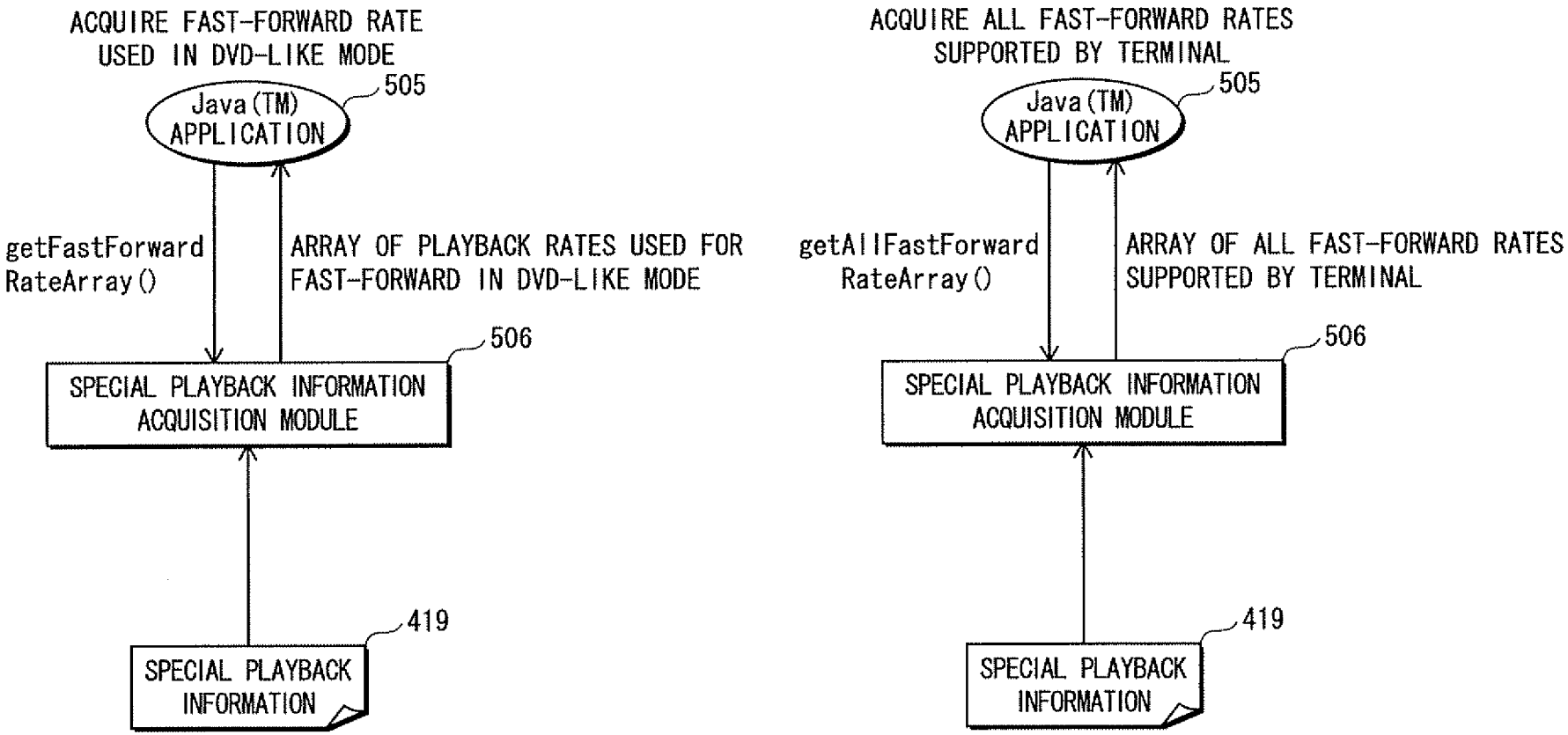

ACQUIRE FAST-FORWARD RATE USED IN DVD-LIKE MODE
Java(TM) APPLICATION
505
getFastForward RateArray()
ARRAY OF PLAYBACK RATES USED FOR FAST-FORWARD IN DVD-LIKE MODE
506
SPECIAL PLAYBACK INFORMATION ACQUISITION MODULE
419
SPECIAL PLAYBACK INFORMATION
ACQUIRE ALL FAST-FORWARD RATES SUPPORTED BY TERMINAL
Java(TM) APPLICATION
505
getAllFastForward RateArray()
ARRAY OF ALL FAST-FORWARD RATES SUPPORTED BY TERMINAL
506
SPECIAL PLAYBACK INFORMATION ACQUISITION MODULE
419
SPECIAL PLAYBACK INFORMATION

FIG. 9

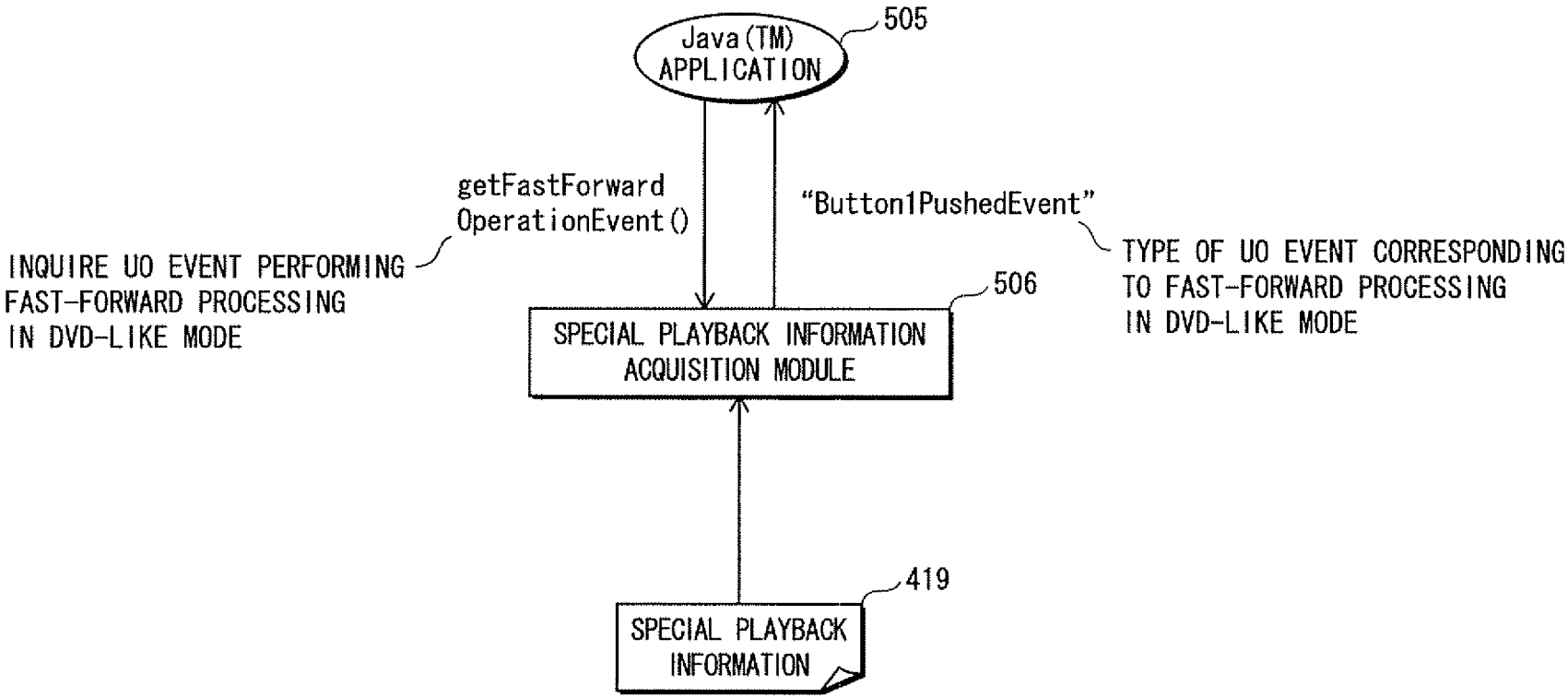

Java(TM)
APPLICATION
505
getFastForward
OperationEvent()
"Button1PushedEvent"
INQUIRE UO EVENT PERFORMING
FAST-FORWARD PROCESSING
IN DVD-LIKE MODE
TYPE OF UO EVENT CORRESPONDING
TO FAST-FORWARD PROCESSING
IN DVD-LIKE MODE
506
SPECIAL PLAYBACK INFORMATION
ACQUISITION MODULE
419
SPECIAL PLAYBACK
INFORMATION

FIG. 10

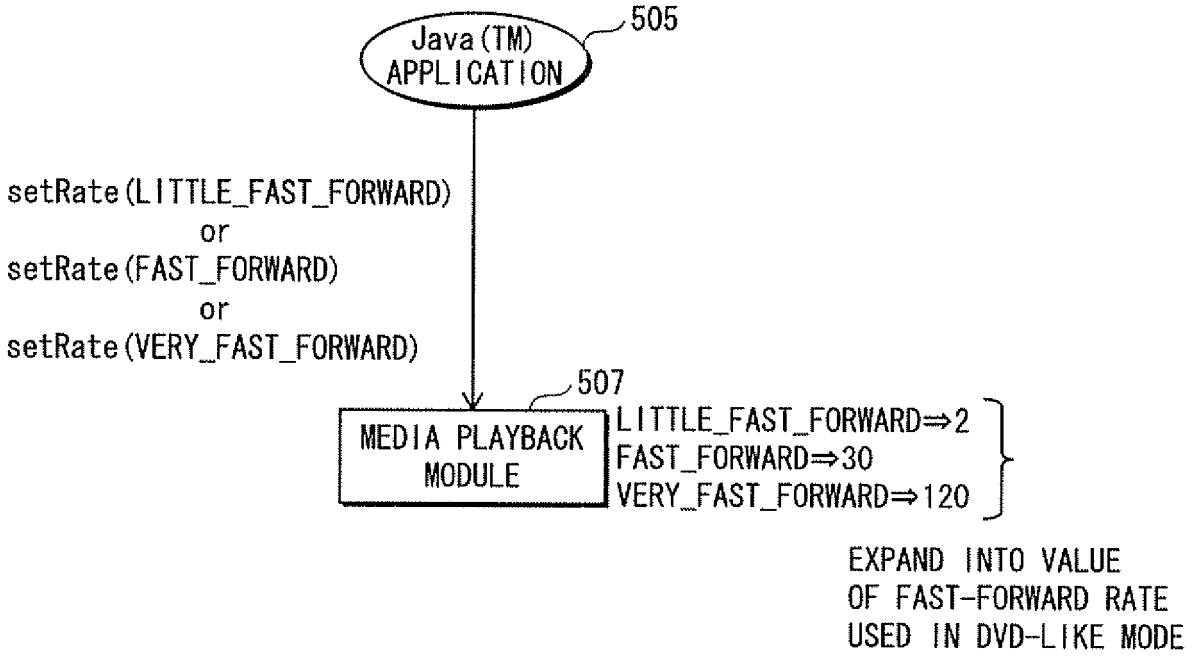

Java(TM)
APPLICATION
505
setRate(LITTLE_FAST_FORWARD)
or
setRate(FAST_FORWARD)
or
setRate(VERY_FAST_FORWARD)
507
MEDIA PLAYBACK
MODULE
LITTLE_FAST_FORWARD⇒2
FAST_FORWARD⇒30
VERY_FAST_FORWARD⇒120
EXPAND INTO VALUE
OF FAST-FORWARD RATE
USED IN DVD-LIKE MODE

FIG. 11

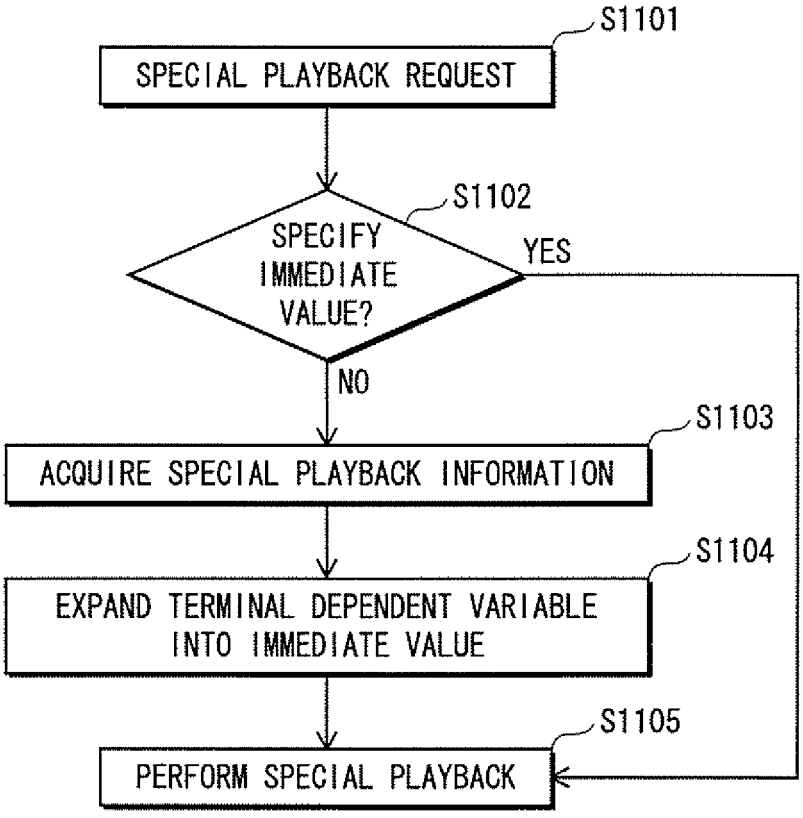

S1101
SPECIAL PLAYBACK REQUEST
S1102
SPECIFY IMMEDIATE VALUE?
YES
NO
S1103
ACQUIRE SPECIAL PLAYBACK INFORMATION
S1104
EXPAND TERMINAL DEPENDENT VARIABLE INTO IMMEDIATE VALUE
S1105
PERFORM SPECIAL PLAYBACK

FIG. 12

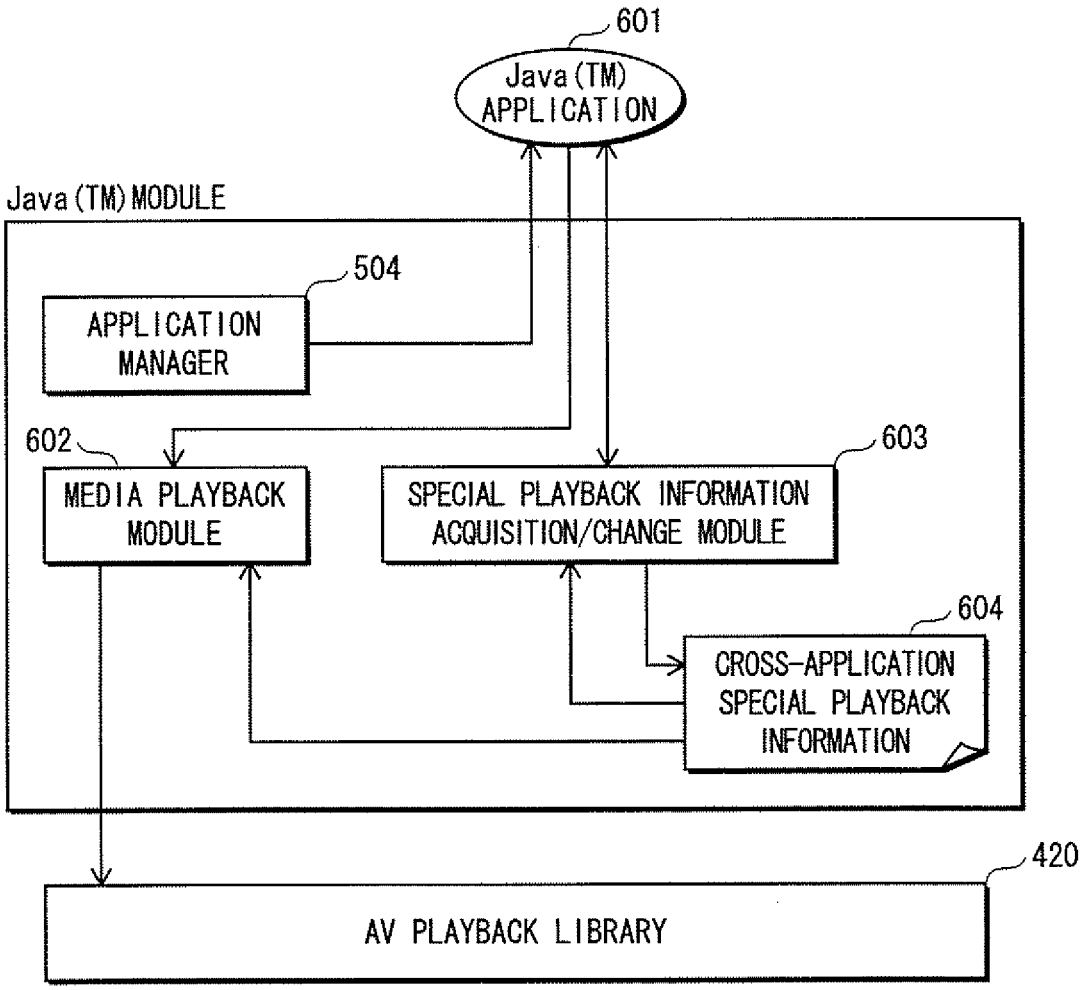

601
Java (TM) APPLICATION
Java (TM) MODULE
504
APPLICATION MANAGER
602
MEDIA PLAYBACK MODULE
603
SPECIAL PLAYBACK INFORMATION ACQUISITION/CHANGE MODULE
604
CROSS-APPLICATION SPECIAL PLAYBACK INFORMATION
420
AV PLAYBACK LIBRARY

FIG. 13

CROSS-APPLICATION SPECIAL PLAYBACK INFORMATION

FAST-FORWARD PLAYBACK

VARIABLE NAME	PLAYBACK RATE
LITTLE_FAST_FORWARD	2.0
FAST_FORWARD	30.0
VERY_FAST_FORWARD	120.0

FAST-BACKWARD PLAYBACK

VARIABLE NAME	PLAYBACK RATE
LITTLE_FAST_BACKWARD	-2.0
FAST_BACKWARD	-30.0
VERY_FAST_BACKWARD	-120.0

SLOW-FORWARD PLAYBACK

VARIABLE NAME	PLAYBACK RATE
LITTLE_SLOW_FORWARD	0.5
SLOW_FORWARD	0.1
VERY_SLOW_FORWARD	0.01

SLOW-BACKWARD PLAYBACK

VARIABLE NAME	PLAYBACK RATE
LITTLE_SLOW_BACKWARD	-0.5
SLOW_BACKWARD	-0.1
VERY_SLOW_BACKWARD	-0.01

FIG. 14

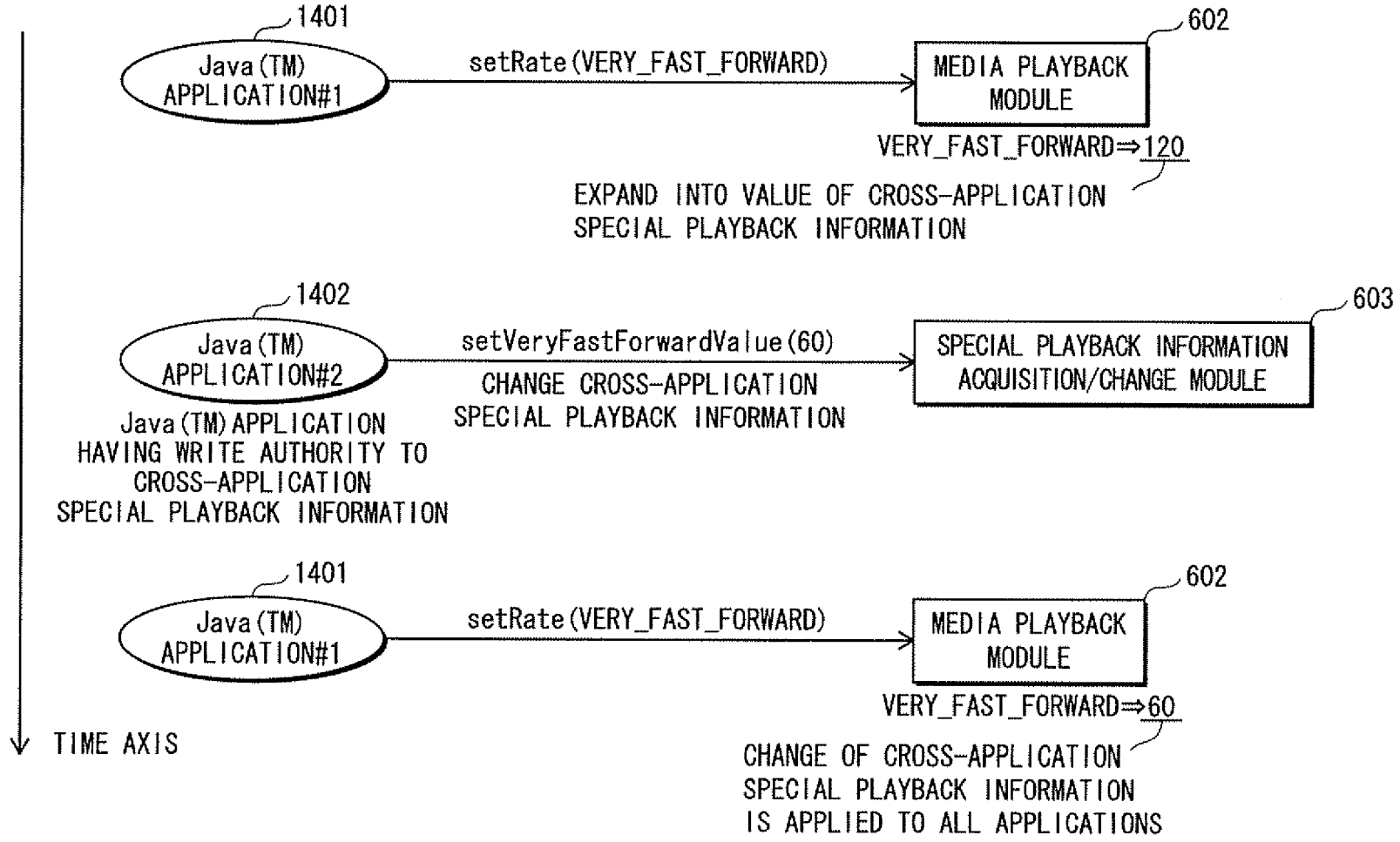

1401
Java(TM) APPLICATION#1
setRate(VERY_FAST_FORWARD)
602
MEDIA PLAYBACK MODULE
VERY_FAST_FORWARD⇒120
EXPAND INTO VALUE OF CROSS-APPLICATION SPECIAL PLAYBACK INFORMATION
1402
Java(TM) APPLICATION#2
setVeryFastForwardValue(60)
603
SPECIAL PLAYBACK INFORMATION ACQUISITION/CHANGE MODULE
CHANGE CROSS-APPLICATION SPECIAL PLAYBACK INFORMATION
Java(TM)APPLICATION HAVING WRITE AUTHORITY TO CROSS-APPLICATION SPECIAL PLAYBACK INFORMATION
1401
Java(TM) APPLICATION#1
setRate(VERY_FAST_FORWARD)
602
MEDIA PLAYBACK MODULE
VERY_FAST_FORWARD⇒60
CHANGE OF CROSS-APPLICATION SPECIAL PLAYBACK INFORMATION IS APPLIED TO ALL APPLICATIONS
TIME AXIS

FIG. 15

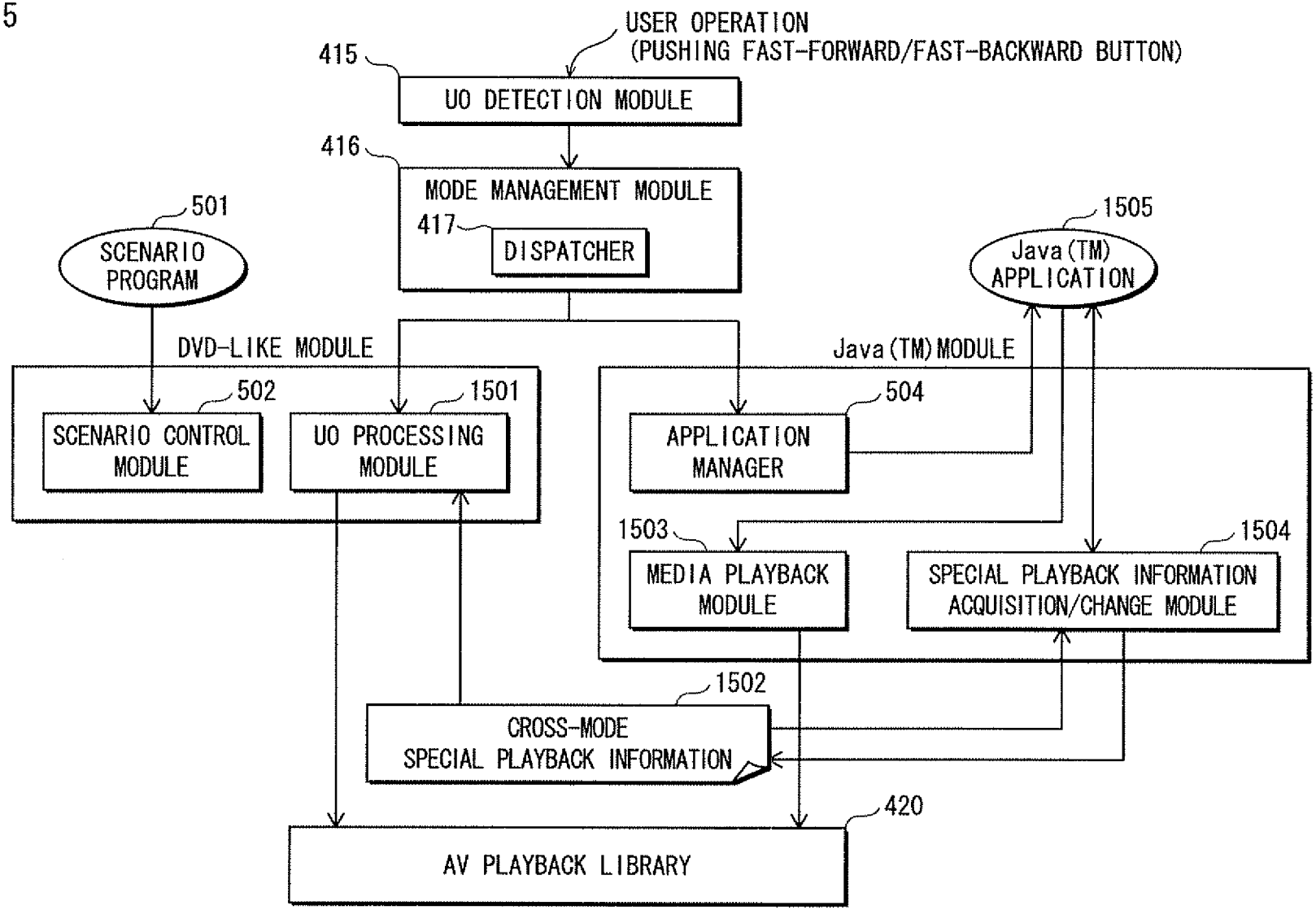

USER OPERATION
(PUSHING FAST-FORWARD/FAST-BACKWARD BUTTON)
415
UO DETECTION MODULE
416
MODE MANAGEMENT MODULE
417
DISPATCHER
501
SCENARIO PROGRAM
1505
Java(TM) APPLICATION
DVD-LIKE MODULE
Java(TM) MODULE
502
SCENARIO CONTROL MODULE
1501
UO PROCESSING MODULE
504
APPLICATION MANAGER
1503
MEDIA PLAYBACK MODULE
1504
SPECIAL PLAYBACK INFORMATION ACQUISITION/CHANGE MODULE
1502
CROSS-MODE SPECIAL PLAYBACK INFORMATION
420
AV PLAYBACK LIBRARY

FIG. 16

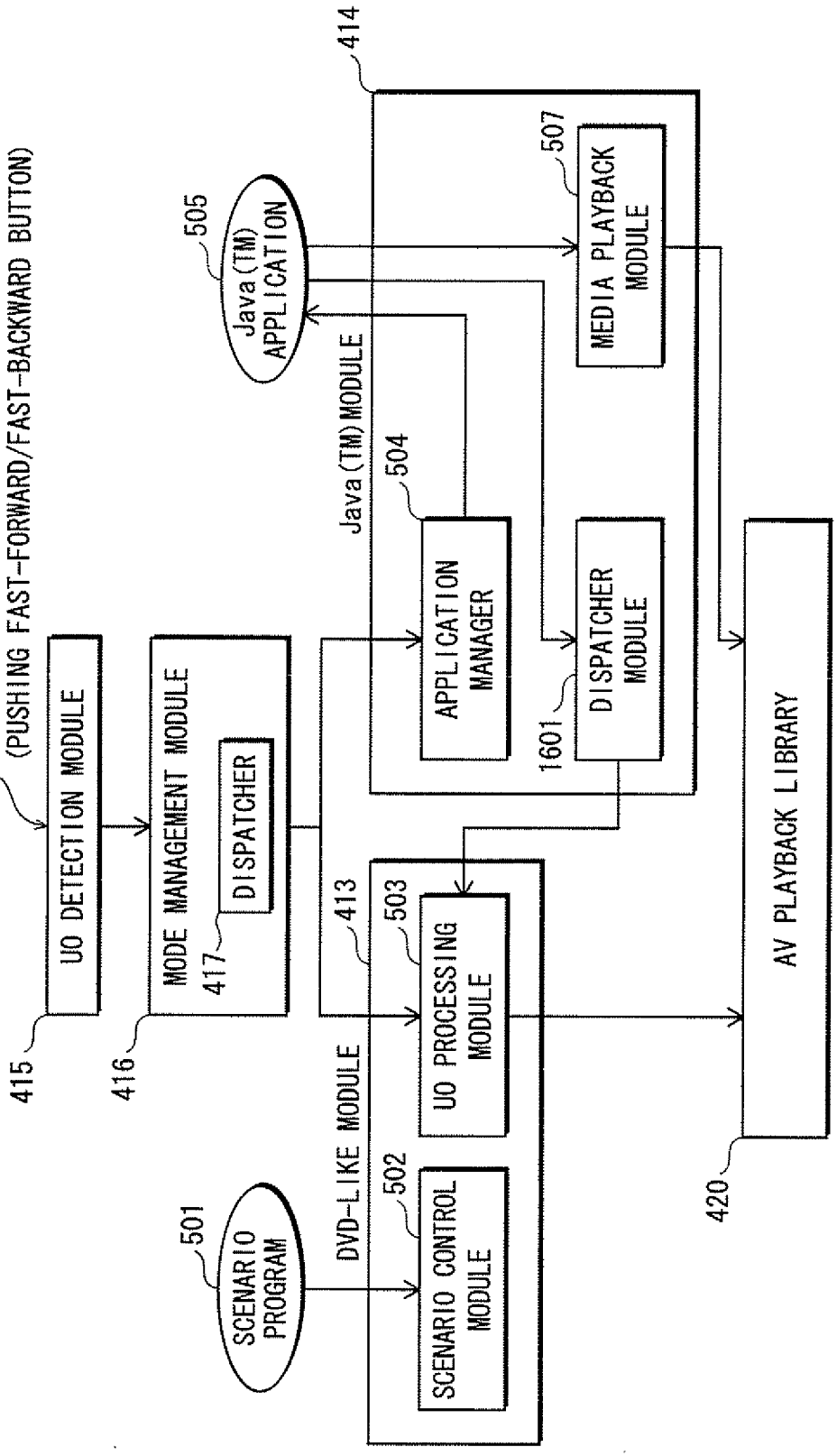

USER OPERATION
(PUSHING FAST-FORWARD/FAST-BACKWARD BUTTON)
UO DETECTION MODULE
415
MODE MANAGEMENT MODULE
DISPATCHER
417
416
413
DVD-LIKE MODULE
SCENARIO PROGRAM
501
SCENARIO CONTROL MODULE
502
UO PROCESSING MODULE
503
Java (TM) MODULE
APPLICATION MANAGER
504
Java (TM) APPLICATION
505
414
DISPATCHER MODULE
1601
MEDIA PLAYBACK MODULE
507
AV PLAYBACK LIBRARY
420

FIG. 17

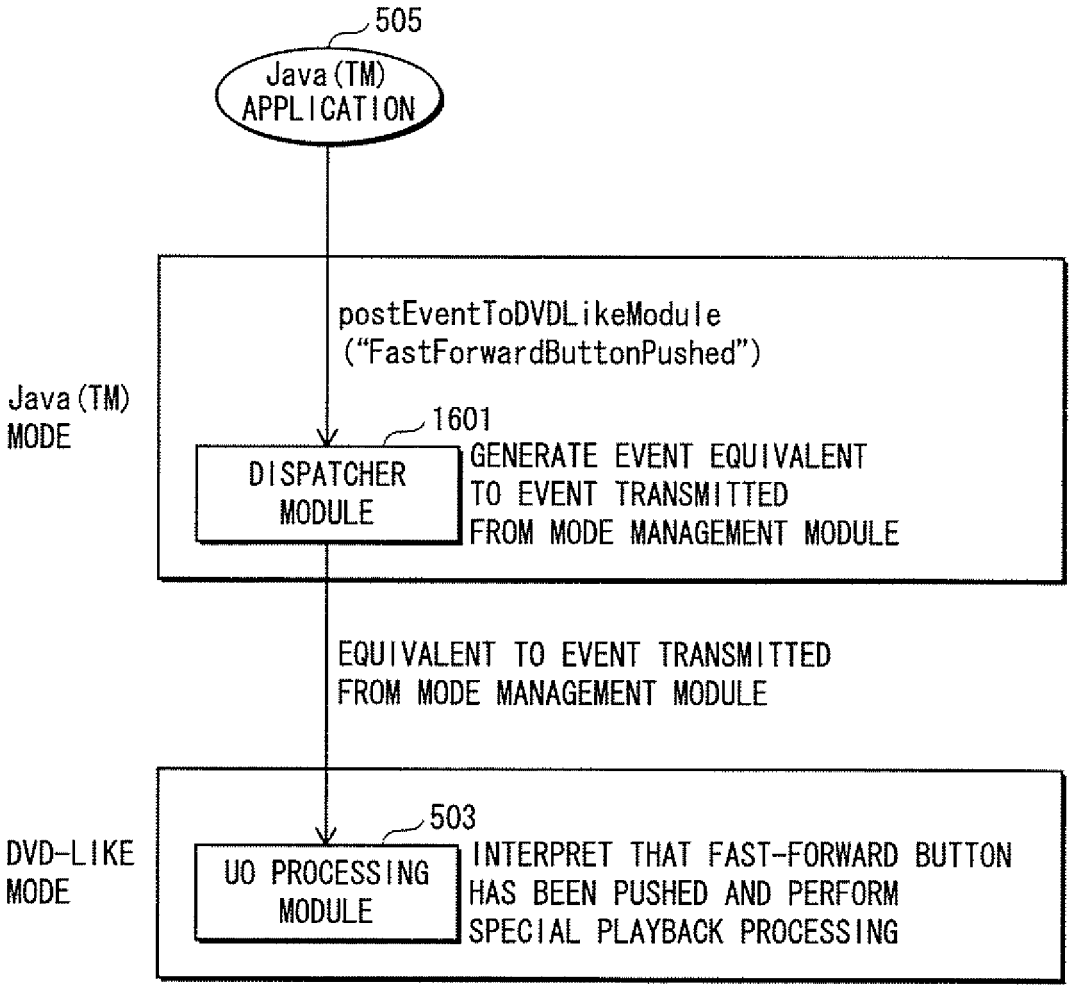
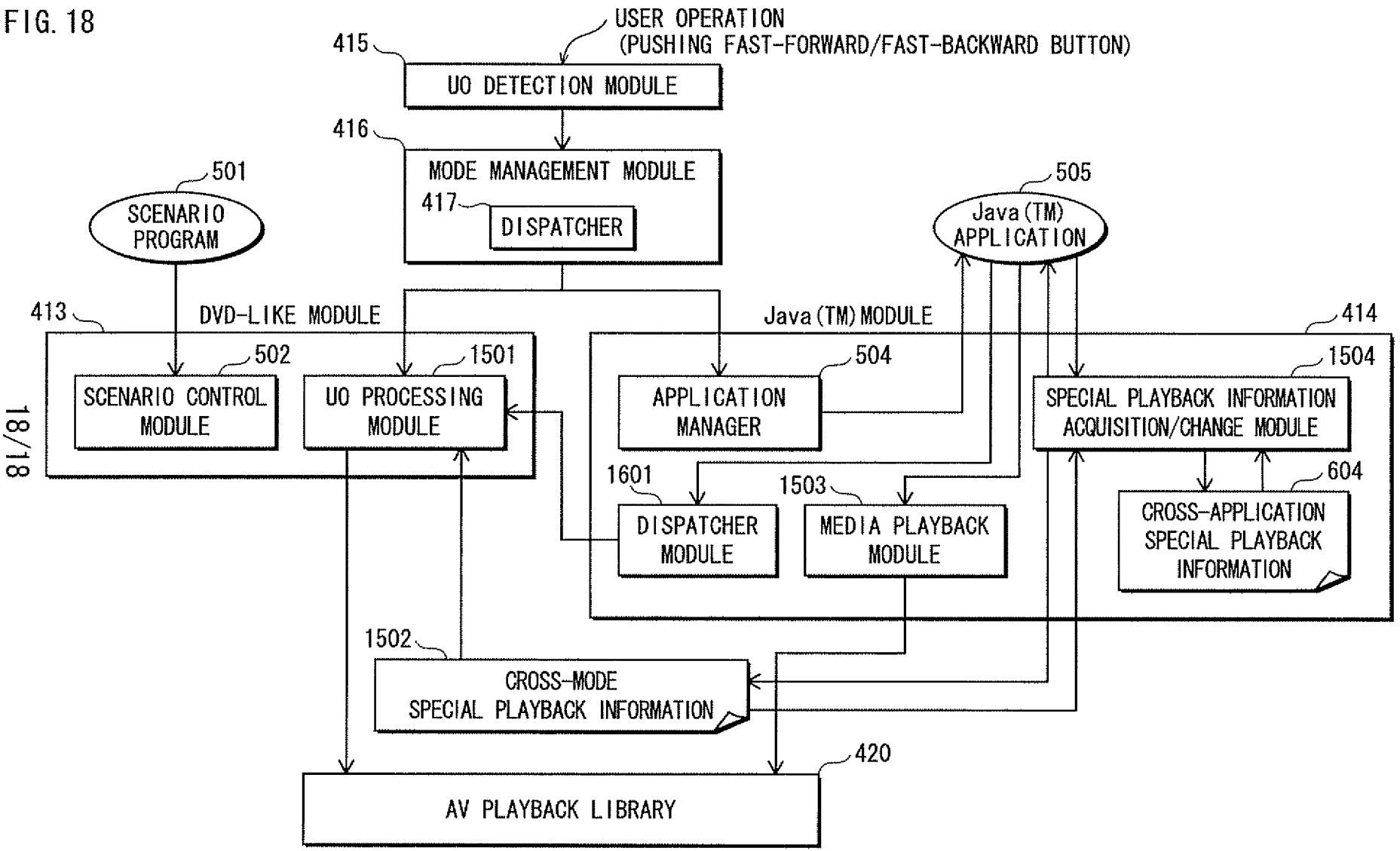

505
Java(TM) APPLICATION
postEventToDVDLikeModule ("FastForwardButtonPushed")
Java(TM) MODE
1601
DISPATCHER MODULE
GENERATE EVENT EQUIVALENT TO EVENT TRANSMITTED FROM MODE MANAGEMENT MODULE
EQUIVALENT TO EVENT TRANSMITTED FROM MODE MANAGEMENT MODULE
503
DVD-LIKE MODE
UO PROCESSING MODULE
INTERPRET THAT FAST-FORWARD BUTTON HAS BEEN PUSHED AND PERFORM SPECIAL PLAYBACK PROCESSING

FIG. 18


USER OPERATION
(PUSHING FAST-FORWARD/FAST-BACKWARD BUTTON)
415
UO DETECTION MODULE
416
MODE MANAGEMENT MODULE
417
DISPATCHER
501
SCENARIO PROGRAM
505
Java(TM) APPLICATION
413
DVD-LIKE MODULE
Java(TM) MODULE
414
502
SCENARIO CONTROL MODULE
1501
UO PROCESSING MODULE
504
APPLICATION MANAGER
1504
SPECIAL PLAYBACK INFORMATION ACQUISITION/CHANGE MODULE
1601
DISPATCHER MODULE
1503
MEDIA PLAYBACK MODULE
604
CROSS-APPLICATION SPECIAL PLAYBACK INFORMATION
1502
CROSS-MODE SPECIAL PLAYBACK INFORMATION
420
AV PLAYBACK LIBRARY